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## TABLES

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**Table 2-1  
Newmark and Muscoy OU RD/RA Timeline  
September 2005**

Phase	Element	Location	Time Period
Newmark ROD			
Record of Decision	Newmark OU	ROD issued	August 4, 1993
Newmark RD			
100% Design Submittal	Water Treatment Plants	Newmark North Water Treatment Plant	September 1997
		Newmark South Water Treatment Plant	September 1997
Newmark RA			
Construction	Water Treatment Plants	Newmark North Water Treatment Plant	September 1997 - July 1998
		Newmark South Water Treatment Plant	September 1997 - July 1998
		17th Street Plant Retrofit	August 1998 - October 1998
		GAC Vessels	June 1997 - September 1998
	Pipelines	Freeway Bridge Overcrossing	April 1998 - June 1998
	Monitoring Wells	MW-12 through MW-15	August 1997 - October 1997
		MW-16 through MW-17	October 1997 - November 1997
	Pipelines	North Pipeline	March 1998 - October 1998
		South Pipeline	September 1996 - October 1998
	Extraction Wells	North Well EW-6, EW-7, Newmark-3	September 1996 - May 1997
EW-1 through EW-5		September 1996 - May 1997	
Muscoy ROD			
Record of Decision	Muscoy OU	ROD issued	March 25, 1995
Muscoy RD			
100% Design Submittal	Water Treatment Plants	Muscoy 19th Street Water Treatment Plant	September 2003
Muscoy RA			
Construction	Water Treatment Plant	Muscoy 19th Street Water Treatment Plant	March 2004 - February 2006
	Booster Pump Station	Encanto Park Booster Pump Station	March 2004 - February 2006
	Pipelines	Pipeline Phase I	August 2000 - February 2001
		Pipeline Phase II	August 2002 - May 2003
		I-215 / BNSF Railroad Undercrossing	December 2004 - April 2005
	Monitoring Wells	MW-135 through MW-139	February 2002 - April 2002
	Extraction Wells	EW-108 through EW-112	May 2001 - December 2004
Shakedown Period	Water Treatment Plant	Muscoy 19th Street Water Treatment Plant	March 2005 - May 2005
One Year Performance Evaluation Period	Water Treatment Plant	Muscoy 19th Street Water Treatment Plant	July 2005 - July 2006

EW - Extraction Well  
MW - Monitoring Well  
OU - Operable Unit  
RA - Remedial Action  
RD - Remedial Design  
ROD - Record of Decision

**Table 2-2  
Muscoy OU Extraction Well Construction Details  
September 2005**

Well	HS Zone	Casing Elevation (ft above msl)	Casing Diameter (in)	Screened Interval (ft bgs)	Screen Slot Size (in)	Gravel Fill Pipe Depths (ft bgs)	Camera Tube Depth (ft bgs)	Total Well Depth (ft bgs)	Design Flow Rate (gpm)
EW-108	2	1119.26	20	510-590 670-1000	0.07	310 510	NA	1010	1,300
EW-108PA	1	1119.26	4	370-390	0.02			390	
EW-108PB	3	1119.26	4	740-760	0.02			760	
EW-109	2	1137.05	20	260-330 420-500 550-610 710-840	0.08	260 420 710	405	860	1,300
EW-109PZA	1	1137.05	4	310-330	0.02			330	
EW-109PZB	2	1137.05	4	430-450	0.02			450	
EW-109PZC	3	1137.05	4	800-820	0.02			820	
EW-110	2	1149.30	20	225-270 305-650 715-855	0.08	305 710	395.5	865	2,500
EW-110PZA	0.5	1145.50	3	193.5-243.5	0.02			243.5	
EW-110PZB	1	1145.48	3	301.5-321.5	0.02			321.5	
EW-110PZC	1.9	1145.49	3	411.5-431.5	0.02			431.5	
EW-110PZD	2	1145.51	3	491.5-511.5	0.02			511.5	
EW-110PZE	3	1149.30	4	830-850	0.02			850	
EW-111	2	1169.51	20	235-265 305-665 765-1250	0.08	305 765	410	1260	2,500
EW-111PZA	0.5	1165.68	3	193.5-243.5	0.02			243.5	
EW-111PZB	1	1165.69	3	375.5-395.5	0.02			395.5	
EW-111PZC	2	1165.70	3	456-476	0.02			476	
EW-111PZD	2.1	1169.49	4	780-800	0.02			800	
EW-112	2	1181.79	20	280-740 800-890	0.08	270 800	NA	900	1,300
EW-112PA	1	1181.79	4	300-320	0.02			320	
EW-112PB	2	1181.79	4	660-680	0.02			680	

bgs=below ground surface  
 EW=extraction well  
 ft=foot  
 gpm=gallons per minute  
 hp=horsepower  
 HS= Hydrostratigraphic Zone  
 in=inch  
 msl=mean sea level  
 NA= not available  
 OU=operable unit

**Table 2-3**  
**Muscoy OU Monitoring Well Construction Details**  
**September 2005**

Well	HS Zone	Upgradient or Downgradient	Casing Elevation (ft above msl)	Total Well Depth	Casing Diameter	Screened Interval	Screen Slot Size
				(ft)	(in)	(ft bgs)	(in)
MW-128A	1	UG	1215.04	440	4	410-440	0.02
MW-128B	1.5	UG	1215.04	720	4	690-720	0.02
MW-128C	2	UG	1215.04	890	4	860-890	0.02
MW-129A	1	UG	1199.32	473	4	443-473	0.02
MW-129B	2	UG	1198.91	760	4	730-760	0.02
MW-129C	2.1	UG	1198.92	881	4	851-881	0.02
MW-130A	1	UG	1175.22	370	4	340-370	0.02
MW-130B	1.5	UG	1174.58	580	4	550-580	0.02
MW-130C	2	UG	1174.56	920	4	890-920	0.02
MW-135A	1	DG	1111.28	380	4	360-380	0.02
MW-135B	3	DG	1111.28	640	4	620-640	0.02
MW-135C	3	DG	1111.3	870	4	850-870	0.02
MW-136A	1.9	DG	1121.67	440	4	420-440	0.02
MW-136B	2	DG	1121.63	520	4	500-520	0.02
MW-136C	3	DG	1121.61	750	4	730-750	0.02
MW-137A	1	DG	1144.05	350	4	330-350	0.02
MW-137B	2	DG	1144.1	540	4	520-540	0.02
MW-137C	3	DG	1144.07	810	4	790-810	0.02
MW-138A	1	DG	1156.87	340	4	320-340	0.02
MW-138B	2	DG	1156.92	570	4	550-570	0.02
MW-138C	3	DG	1156.99	980	4	960-980	0.02
MW-139A	1	DG	1168.76	380	4	360-380	0.02
MW-139B	2	DG	1168.71	560	4	540-560	0.02
MW-139C	3	DG	1168.85	810	3	790-810	0.01

bgs=below ground surface  
 DG=downgradient  
 EW=extraction well  
 ft=foot  
 gpm=gallons per minute  
 HS= Hydrostratigraphic Zone  
 in=inch  
 msl=mean sea level  
 OU=operable unit  
 UG=upgradient

**Table 2-4**  
**Hydrostratigraphic Zones for Newmark and Muscoy Water-Level And Plume Delineation**

URS Well Name	City Well Name	HS Zone	Well Elevation (ft msl)	Screen Length (ft)	Screen Interval (ft bgs)	Layer	Stratigraphic Regime	Use For GWL Contouring	Use for Plume Delineation
EW-1	EPA 001	3	1093.90	590	600-1190	Deep	Newmark		X
EW-1A	EPA 001A	1	1093.90	20	380-400	Shallow	Newmark	X	X
EW-1B	EPA 001B	3	1119.26	20	980-1000	Deep	Newmark	X	
EW-2	EPA 002	3	1091.70	570	500-1070	Deep	Newmark		X
EW-2A	EPA 002A	1	1091.70	20	230-250	Shallow	Newmark	X	X
EW-2B	EPA 002B	3	1093.90	20	880-900	Deep	Newmark	X	
EW-3	EPA 003	3	1090.22	420	240-280, 320-400, 500-800	Deep	Newmark		X
EW-3A	EPA 003A	1	1090	20	230-250	Shallow	Newmark	X	X
EW-3B	EPA 003B	3	1090	20	760-780	Deep	Newmark	X	
EW-4	EPA 004	3	1086.27	690	490-1180	Deep	Newmark	X	X
EW-4A	EPA 004A	1	1086	20	310-330	Shallow	Newmark	X	X
EW-4B	EPA 004B	3	1086	20	980-1000	Deep	Newmark		
EW-5	EPA 005	3	1083.27	730	400-1130	Deep	Newmark		X
EW-5A	EPA 005A	1	1083	20	230-250	Shallow	Newmark	X	X
EW-5B	EPA 005B	3	1083	20	880-900	Deep	Newmark	X	
EW-108	EPA 108	2	1119.26		510-590, 670-1000	Deep	Newmark		X
EW-108A	EPA 108A	1	1119.26	20	370-390	Shallow	Muscoy	X	X
EW-108B	EPA 108B	3	1119.26	20	740-760	Deep	Newmark	X	
EW-109	EPA 109	2	1137.05		260-330, 420-500, 550-610, 710-840	All	Muscoy		
EW-109A	EPA 109A	1	1137.05	20	310-330	Shallow	Muscoy	X (correct for well inefficiency)	X
EW-109B	EPA 109B	2	1137.05	20	430-450	Intermediate*	Muscoy	X (correct for well inefficiency)	X
EW-109C	EPA 109C	3	1137.05	20	800-820	Deep	Muscoy	Chemistry Only/no Water Level	X
EW-110	EPA 110	2	1145.50		225-270, 305-650, 715-855,	All	Muscoy		
EW-110A	EPA 110A	0.5	1145.50	40	193.5-243.5	Shallow	Muscoy		
EW-110B	EPA 110B	1	1145.48	20	301.5-321.5	Shallow	Muscoy	X	X
EW-110C	EPA 110C	1.9	1145.49	20	411.5-431.5	Intermediate	Muscoy		
EW-110D	EPA 110D	2	1145.51	20	491.5-511.5	Intermediate	Muscoy	X	X
EW-110E	EPA 110E	3	1149.30	20	830-850	Deep	Muscoy		X
EW-111	EPA 111	2	1165.68		235-265, 305-665, 765-1250	All	Muscoy		

**Table 2-4**  
**Hydrostratigraphic Zones for Newmark and Muscoy Water-Level And Plume Delineation**

URS Well Name	City Well Name	HS Zone	Well Elevation (ft msl)	Screen Length (ft)	Screen Interval (ft bgs)	Layer	Stratigraphic Regime	Use For GWL Contouring	Use for Plume Delineation
EW-111A	EPA 111A	0.5	1165.68	40	193.5-243.5	NA	Muscoy		
EW-111B	EPA 111B	1	1165.69	20	375.5-395.5	Shallow	Muscoy	X	X
EW-111C	EPA 111C	2	1165.70	20	456-476	Intermediate	Muscoy	X	X
EW-111D	EPA 111D	2.1	1169.49	20	780-800	*	Muscoy		X
EW-112	EPA 112	2	1181.79		280-740, 800-890	All	Muscoy		
EW-112A	EPA 112A	1	1181.79	20	300-320	Shallow	Muscoy - West of Fault**	X (correct for well inefficiency)	X
EW-112B	EPA 112B	2	1181.79	20	660-680	Intermediate	Muscoy - West of Fault*	X (correct for well inefficiency)	X
MUNI-101	Olive & Garner	2	1130.00	700	350-1050	Intermediate	Muscoy	Water Level/ Chemistry Diluted	X (shallow chem accounting for diluted chemistry)
MUNI-102	Baseline and California	1	1185.56	196	126-184, 224-232, 262-304, 312-372, 468-476, 540-560	Intermediate	Muscoy - West of Fault*	Chemistry and gwl	
MUNI-103	MW State	1	1214.58	168	60-128, 248-345	Shallow	Muscoy - West of Fault*	Chemistry and gwl	
MUNI-104A	19th #1	1	1230.30	250	150-276, 322-356, 388-400	Shallow	Muscoy	Chemistry and gwl	
MUNI-104B	19th #2	2	1236.25	185	470-512, 554-563, 575-611, 646-658	Intermediate	Muscoy	Chemistry and gwl	
MUNI-107	Colima Replacement	1			To Be Determined	All	X	*	X
MUNI-108	Mallory	2	1319.00	222	350-448, 478-484, 510-628	Intermediate	Muscoy - West of Fault*	Chemistry and gwl	
MUNI-109	Paperboard	1	1328.00	204	227-431	Dry*			
MUNI-112	Cajon #3	1	1894.00	97	150-347	Shallow			
MUNI-116	Muscoy Mutual #5	2	1475.33			Intermediate	Muscoy - West of Fault*	Should Start Sounding Soon	
MUNI-13	Waterman	1	1244.40	324	258-267, 295-610	Shallow			
MUNI-14	31st and Mountain View	2	1233.01	228	325-553	Intermediate			
MUNI-16	Leroy	1*	1239.67	210	450-660	Shallow*			

**Table 2-4**  
**Hydrostratigraphic Zones for Newmark and Muscoy Water-Level And Plume Delineation**

URS Well Name	City Well Name	HS Zone	Well Elevation (ft msl)	Screen Length (ft)	Screen Interval (ft bgs)	Layer	Stratigraphic Regime	Use For GWL Contouring	Use for Plume Delineation
MUNI-18	27th and Acacia	2	1184.07	510	243-259, 290-410, 442-456, 477-717	Intermediate			
MUNI-20	23rd and E	2	1174.75	370	354-370, 428-448, 494-828	Intermediate			
MUNI-22	17th & Sierra #1	2	1141.90	175	494-571, 575-670	Intermediate			
MUNI-23	16th & Sierra	2				Intermediate			
MUNI-24	Gilbert	2	1123.33	183	480-603, 625-685	Intermediate			
MW-10A	MW-010A	1.5	1127.42	30	350-380				
MW-10B	MW-010B	1.9	1127.42	30	490-520				
MW-10C	MW-010C	3	1127.42	30	750-780	Deep			
MW-11A	MW-011A	3	1100.52	30	500-530	Deep	Newmark		
MW-11B	MW-011B	3	1100.52	30	770-800	Deep	Newmark	X	X
MW-11C	MW-011C	3	1100.52	30	1070-1100	Deep	Newmark		
MW-12A	MW-012A	1	1088.51	30	240-270	Shallow	Muscoy *	X	X
MW-12B	MW-012B	3	1088.51	30	670-700	Deep	Newmark	X	X
MW-12C	MW-012C	3	1088.53	30	1040-1070	Deep	Newmark		
MW-13A	MW-013A	1	1078.36	30	365-395	Shallow	Newmark	X	X
MW-13B	MW-013B	3	1078.36	30	525-555	Deep	Newmark	X	X
MW-13C	MW-013C	3	1078.29	30	815-845	Deep	Newmark		
MW-14A	MW-014A	1	1075.73	30	270-300	Shallow	Newmark	X	X
MW-14B	MW-014B	3	1075.73	30	570-600	Deep	Newmark	X	X
MW-14C	MW-014C	3	1075.73	30	1060-1090	Deep	Newmark		
MW-15A	MW-015A	2	1069.38	30	520-550	Deep	Newmark		
MW-15B	MW-015B	3	1069.38	30	690-720	Deep	Newmark	X	X
MW-15C	MW-015C	2.5	1069.38	30	1020-1050	Deep	Newmark		
MW-128A	MW-128A	1	1215.04	30	410-440	Shallow	Muscoy		
MW-128B	MW-128B	1.5	1215.04	30	690-720	Intermediate*	Muscoy		
MW-128C	MW-128C	2	1215.04	30	860-890	Intermediate	Muscoy		
MW-129A	MW-129A	1	1199.32	30	443-473	Shallow	Muscoy		
MW-129B	MW-129B	2	1198.91	30	730-760	Intermediate	Muscoy		
MW-129C	MW-129C	2.1	1198.92	30	851-881	*	Muscoy		
MW-130A	MW-130A	1	1175.22	30	340-370	Shallow	Muscoy		
MW-130B	MW-130B	1.5	1174.58	30	550-580	Shallow	Muscoy		
MW-130C	MW-130C	2	1174.56	30	890-920	Intermediate	Muscoy		
MW-135A	MW-135A	1	1111.28	20	360-380	Shallow	Muscoy		
MW-135B	MW-135B	3	1111.28	20	620-640	Deep	Newmark		
MW-135C	MW-135C	3	1111.30	20	850-870	Deep	Newmark		
MW-136A	MW-136A	1.9	1121.67	20	420-440	Intermediate	Muscoy		
MW-136B	MW-136B	2	1121.63	20	500-520	Intermediate	Muscoy		
MW-136C	MW-136C	3	1121.61	20	730-750	Deep	Muscoy		
MW-137A	MW-137A	1	1144.05	20	330-350	Shallow	Muscoy		
MW-137B	MW-137B	2	1144.10	20	520-540	Intermediate	Muscoy		

**Table 2-4**  
**Hydrostratigraphic Zones for Newmark and Muscoy Water-Level And Plume Delineation**

URS Well Name	City Well Name	HS Zone	Well Elevation (ft msl)	Screen Length (ft)	Screen Interval (ft bgs)	Layer	Stratigraphic Regime	Use For GWL Contouring	Use for Plume Delineation
MW-137C	MW-137C	3	1144.07	20	790-810	Deep	Muscoy		
MW-138A	MW-138A	1	1156.87	20	320-340	Shallow	Muscoy		
MW-138B	MW-138B	2	1156.92	20	550-570	Intermediate	Muscoy		
MW-138C	MW-138C	3	1156.99	20	960-980	Deep	Muscoy		
MW-139A	MW-139A	1	1168.76	20	360-380	Shallow	Muscoy - West of Fault*		
MW-139B	MW-139B	2	1168.71	20	540-560	Intermediate	Muscoy - West of Fault*		
MW-139C	MW-139C	3	1168.85	20	790-810	Deep	Muscoy - West of Fault*		
Encanto USGS	Garner Park B	1	1120.00	25	241-256	Shallow	Muscoy		
Encanto USGS	Garner Park C	2	1120.00	34	536-550	Intermediate*	Muscoy	X	
	Sierra High School A	0.5	1077	20	170-190	NA	Newmark		
	Sierra High School B	1*	1077	60	340-400	Shallow*	Newmark	X *	
	Sierra High School C	3	1077	10	520-530	Deep	Newmark	X	
	9th				270-830,850-970,1000-1030	All	On fault*		X (shallow chem accounting for diluted chemistry)
	Perris				240-640,690-950	All	Muscoy - West of Fault*		X (shallow chem accounting for diluted chemistry)
MUNI-105	Mt. Vernon	1*	1354.21	83	225-308 or to 598 (not clear from City data)	Shallow	Muscoy - West of Fault*	X * (if accessible and no oil)	X *

\*= Unable to determine.

bgs=below ground surface

ft=foot

GWL= ground water level

HS=Hydrostratigraphic zones: Zone 1 (shallow aquifer) is above confining layer ~600-700 ft msl (~500 ft bgs). Zone 2 is the upper portion of the deep aquifer (intermediate zone). Zone 3 is the lower portion of the deep aquifer. Fractional zones show int

msl=mean sea level

MW=monitoring well

USGS=United States Geological Survey



**Table 3-1  
Muscoy Project Event and Deliverable Tracker**

Muscoy Operation and Functional Period: Officially started on July 25, 2005.																
MUSCOY OU SHAKEDOWN LOG OF EVENTS BEGINNING FEBRUARY 16, 2005																
Summary of Shakedown & Startup				From	To											
System pre start up				3/14/2005	6/17/2005											
4 week start up test (shake down)				3/14/2005	6/10/2005											
1 week recovery				6/13/2005	6/17/2005											
Extraction well sequential start up				6/20/2005	7/22/2005											
EW-108 program SCADA system and manual WLs				6/20/2005	6/24/2005											
EW-109 program SCADA system and manual WLs				6/27/2005	7/1/2005											
EW-110 program SCADA system and manual WLs				7/5/2005	7/8/2005											
EW-111 program SCADA system and manual WLs				7/11/2005	7/15/2005											
EW-112 program SCADA system and manual WLs				7/18/2005	7/22/2005											
Baseline sampling (Month 0) concurrent w/ LTMP				4/4/2005	4/19/2005											
PDB deployment				4/4/2005	4/7/2005											
GW sampling				4/11/2005	4/21/2005											
Receive preliminary data				5/19/2005												
Receive final lab data				9/1/2005												
System on line (START UP) on 7/25/2005				Responsible												
Monthly operation from August 2005 to July 2006				Party	August 2005	September 2005	October 2005	November 2005	December 2005	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006
Water level from SBMWD to URS				SBMWD	9/15/2005	10/15/2005	11/15/2005	12/15/2005	1/15/2006	2/15/2006	3/15/2006	4/13/2006	5/15/2006	6/15/2006	x	x
Plant operational data from SBMWD to URS				SBMWD	10/3/2005	10/13/2005	11/16/2005	12/20/2005	1/13/2006	2/15/2006	3/15/2006	4/13/2006	5/15/2006	6/15/2006	7/14/2006	x
URS monthly plant inspection				URS	9/7/2005	10/11/2005	11/16/2005	12/14/005	1/19/2006	2/16/2006	3/22/2006	4/26/2006	5/24/2006	6/20/2006	7/20/2006	x
Request for analysis				URS	7/14/2005	8/25/2005	9/28/2005	10/20/2005	11/22/2005	12/20/2005	1/23/2006	3/2/2006	3/27/2006	4/14/2006	5/26/2006	6/27/2006
Lab assignment				EPA	8/16/2005	9/13/2005	10/11/2005	11/7/2005	12/8/2005	1/5/2006	2/15/2006	3/20/2006	4/20/2006	5/2/2006	x	x
Deploy PDBs				URS	8/9/2005	8/24/2005	9/21/2005	10/19/2005	11/16/2005	12/14/2005				4/17/2006		x
Monthly/quarterly GW sampling (wells)				URS	8/24/2005	9/21/2005	10/19/2005	11/16/2005	12/14/2005	1/12/2006				5/1/06 (site-wide)		x (late-July)
Deploy next sampling event PDBs				URS	8/24/2005	9/21/2005	10/19/2005	11/16/2005	12/14/2005	1/12/2006						x
Monthly treatment plant sampling				SBMWD	8/17/2005	9/30/2005	10/24/2005	11/16/2005	12/14/2005	1/12/2006	2/21/2006	3/21/2006	4/19/2006	5/4/2006	6/20/2006	x
Receive final lab data				URS	9/14/2005	10/11/2005	10/31/2005	12/6/2005	1/3/2006	2/1/2006	5/22/2006	4/12/2006	6/1/2006	6/1/2006	x	x
Receive validated data				URS	11/17/2005	4/26/2006	4/13/2006	4/13/2006	04/26/06	4/13/2006	5/23/2006	5/22/2006	6/2/2006	x	x	x
Draft monthly report				URS	x	x	x	5/10/2006	x	x	x	x	x	x	x	x
Report comments				EPA/SBMWD	x	x	x	x	x	x	x	x	x	x	x	x
Final monthly report				URS	x	x	x	x	x	x	x	x	x	x	x	x
Other general comments				EPA/SBMWD	x	x	x	x	x	x	x	x	x	x	x	x
Spinner tests																
Perform spinner tests				URS			10/10/2005						4/25/2006			
Analyze data				URS				11/28/2005						x		
Draft report				URS					12/8/2005						x	
Report comments				EPA/SBMWD						x						x
Final report				URS							x					x
Other general comments				EPA/SBMWD								x				x
Zone sampling																
Conduct zone sampling				URS		1/16-1/17/06				1/18/2006			4/25/2006			
Receive final lab data				URS		2/3/2006				2/15/2006			6/1/2006			
Receive validated data				URS						4/13/2006			x			
Other general comments				EPA/SBMWD						x			x			
Long Term Monitoring Plan (LTMP) for both Newmark and Muscoy																
Deploy PDBs for wells not sampled by SBMWD				URS	August 2005	September 2005	October 2005	November 2005	December 2005	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006
Conduct LTMP samples for Newmark and Muscoy				URS			10/20/2005						4/18/06*			
Receive final lab data				URS				11/11/2005						4/28-5/9/06		
Receive validated data				URS				12/6/2005	12/6/2005					6/1/2006		
Draft report (included in monthly report)				URS				4/13/2006						x		
Report comments				EPA/SBMWD				x						x		
Final report (included in monthly report)				URS				x						x		
Other general comments				EPA/SBMWD				x						x		
* Note: URS also deployed PDBs for SBMWD in MWs 135-139 to assist City (these are wells for which they desire to split samples)																

**Table 3-1  
Muscoy Project Event and Deliverable Tracker**

Semi-annual Performance Reports			August 2005	September 2005	October 2005	November 2005	December 2005	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006
<b>1st semi-annual performance report</b>														
	Including all shake down and start up data analysis	URS												
	Including flow data analysis for months	URS	x	x	x	x	x	x						
	Including monthly chemical data analysis for months	URS	x	x	x	x	x	x						
	Including zone sampling analysis for month	URS						x						
	Including LTMP analysis for month	URS				x								
	Draft report	URS												x
	Comments	EPA/SBMWD												x
	Final report	URS												
	Other general comments	EPA/SBMWD												
<b>2nd semi-annual performance report</b>														
	Including flow data analysis for months	URS							x	x	x	x	x	x
	Including monthly chemical data analysis for months	URS									x			x
	Including zone sampling analysis for month	URS									x			
	Including LTMP analysis for month	URS										x		
	Draft report (due 12/12/06)	URS												
	Comments (due 1/25/07)	EPA/SBMWD												
	Final report (due 2/27/07)	URS												
	Other general comments	EPA/SBMWD												
Other deliverables (see Deliverables Table)			August 2005	September 2005	October 2005	November 2005	December 2005	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006
	Draft Pipeline Phase I Report (submitted 8/9/01)	URS												
	Comments (none received)	EPA/SBMWD/E2												
	Final Pipeline Phase I Inspection Report	URS					12/20/2005							
	Draft Pipeline Phase II Report (submitted 7/21/03)	URS												
	Comments (none received)	EPA/SBMWD/E2												
	Final Pipeline Phase II Inspection Report	URS					12/20/2005							
	Draft I215/BNSF Inspection Report (submitted 5/5/05)	URS												
	Comments (none received)	EPA/SBMWD/E2												
	Final I215/BNSF Construction Inspection Report	URS					12/20/2005							
	Draft Treatment Plant Construction Inspection Report	URS										5/26/2006		
	Comments	EPA/SBMWD/E2										6/15/2006		
	Final Treatment Plant Construction Inspection Report	URS											7/10/2006	
	Draft Carbon Vessel Construction Inspection Report	URS			10/18/2005									
	Comments	EPA/SBMWD/E2						1/26/2006						
	Final Carbon Vessel Construction Inspection Report	URS									4/10/2006			
	Draft Extraction Well and Monitoring Well Installation Report	URS											6/30/2006	
	Comments	EPA/SBMWD/E2												x
	Final Extraction Well and Monitoring Well Installation Report	URS												x
	Draft O&M Manual (submitted 3/9/05)	URS												
	Comments	EPA/SBMWD/E2										5/5/2006		
	Final O&M Manual	URS											6/15/2006	
	Draft Cost and Performance Report (due 2/27/07)	URS												
	Comments (due 4/12/07)	EPA/SBMWD/E2												
	Final Cost and Performance Report (due 4/27/07)	URS												
	Draft RA Report (due 3/28/07)	URS												
	Comments (due 5/11/07)	EPA/SBMWD/E2												
	Final RA Report (due 5/28/07)	URS												
	Draft Well Site Report	SBMWD												
	Comments	EPA/URS/E2												
	Final Well Site Report	SBMWD												
		SBMWD												

**Table 4-1**  
**Groundwater Elevation Collection Methods and Frequencies**

Monitoring Point ID	GW Elevation Collection Method	Minimum GW Elevation Collection Frequency
CJ-10	Manual	4 times yearly
CJ-11	Manual	4 times yearly
CJ-12	Manual	4 times yearly
CJ-13	Manual	4 times yearly
CJ-14	Manual	4 times yearly
CJ-15	Manual	4 times yearly
CJ-16	Manual	4 times yearly
CJ-17	Manual	4 times yearly
CJ-3	Manual	4 times yearly
CJ-8	Manual	4 times yearly
EW-1	Manual	monthly
EW-108	Manual	monthly
EW-108PA	SCADA	2 times daily
EW-108PB	SCADA	2 times daily
EW-109	Manual	monthly
EW-109PA	SCADA	2 times daily
EW-109PB	SCADA	2 times daily
EW-110	Manual	monthly
EW-110PA	SCADA	2 times daily
EW-110PB	SCADA	2 times daily
EW-110PC	SCADA	2 times daily
EW-110PD	SCADA	2 times daily
EW-110PE	SCADA	2 times daily
EW-111	Manual	monthly
EW-111PA	SCADA	2 times daily
EW-111PB	SCADA	2 times daily
EW-111PC	SCADA	2 times daily
EW-111PD	SCADA	2 times daily
EW-112	Manual	monthly
EW-112PA	SCADA	2 times daily
EW-112PB	SCADA	2 times daily
EW-1PA	SCADA	2 times daily
EW-1PB	SCADA	2 times daily
EW-2	Manual	monthly
EW-2PA	SCADA	2 times daily
EW-2PB	SCADA	2 times daily
EW-3	Manual	monthly
EW-3PA	SCADA	2 times daily
EW-3PB	SCADA	2 times daily
EW-4	Manual	monthly
EW-4PA	SCADA	2 times daily
EW-4PB	SCADA	2 times daily
EW-5	Manual	monthly
EW-5PA	SCADA	2 times daily
EW-5PB	SCADA	2 times daily
EW-6	Manual	monthly
EW-6PA	SCADA	2 times daily
EW-7	Manual	monthly
EW-7PA	SCADA	2 times daily
MUNI-07B	Manual	4 times yearly

**Table 4-1**  
**Groundwater Elevation Collection Methods and Frequencies**

<b>Monitoring Point ID</b>	<b>GW Elevation Collection Method</b>	<b>Minimum GW Elevation Collection Frequency</b>
MUNI-09B	Manual	4 times yearly
MUNI-09C	Manual	4 times yearly
MUNI-103	Manual	4 times yearly
MUNI-109	Manual	4 times yearly
MUNI-11A	Manual	4 times yearly
MUNI-11C	Manual	4 times yearly
MW02A	Manual	4 times yearly
MW02B	Manual	4 times yearly
MW03A	Manual	4 times yearly
MW03B	Manual	4 times yearly
MW04A	SCADA	2 times daily
MW04B	SCADA	2 times daily
MW05A	Manual	4 times yearly
MW05B	Manual	4 times yearly
MW06A	Manual	4 times yearly
MW06B	Manual	4 times yearly
MW07A	SCADA	2 times daily
MW07B	SCADA	2 times daily
MW08A	Manual	4 times yearly
MW08B	Manual	4 times yearly
MW09A	SCADA	2 times daily
MW09B	SCADA	2 times daily
MW10A	SCADA	2 times daily
MW10B	SCADA	2 times daily
MW11A	SCADA	2 times daily
MW11B	SCADA	2 times daily
MW-128A	INW	2 times daily
MW-128B	INW	2 times daily
MW-128C	INW	2 times daily
MW-129A	INW	2 times daily
MW-129B	INW	2 times daily
MW-129C	INW	2 times daily
MW12A	SCADA	2 times daily
MW12B	SCADA	2 times daily
MW-130A	INW	2 times daily
MW-130B	INW	2 times daily
MW-130C	INW	2 times daily
MW-131A	Manual	4 times yearly
MW-131B	Manual	4 times yearly
MW-131C	Manual	4 times yearly
MW-132A	Manual	4 times yearly
MW-132B	Manual	4 times yearly
MW-133A	Manual	4 times yearly
MW-133B	Manual	4 times yearly
MW-134	Manual	4 times yearly
MW-135A	INW	2 times daily
MW-135B	INW	2 times daily
MW-135C	INW	2 times daily
MW-136A	INW	2 times daily
MW-136B	INW	2 times daily

**Table 4-1**  
**Groundwater Elevation Collection Methods and Frequencies**

Monitoring Point ID	GW Elevation Collection Method	Minimum GW Elevation Collection Frequency
MW-137A	INW	2 times daily
MW-137B	INW	2 times daily
MW-137C	INW	2 times daily
MW-138A	INW	2 times daily
MW-138B	INW	2 times daily
MW-138C	INW	2 times daily
MW-139A	INW	2 times daily
MW-139B	INW	2 times daily
MW-139C	INW	2 times daily
MW13A	SCADA	2 times daily
MW13B	SCADA	2 times daily
MW13C	SCADA	2 times daily
MW14A	SCADA	2 times daily
MW14B	SCADA	2 times daily
MW15A	SCADA	2 times daily
MW15B	SCADA	2 times daily
MW16A	SCADA	2 times daily
MW16B	SCADA	2 times daily
MW17A	SCADA	2 times daily
MW17B	SCADA	2 times daily
MWCOE001A	Manual	4 times yearly
MWCOE001B	Manual	4 times yearly
MWCOE002	Manual	4 times yearly
MWCOE003	Manual	4 times yearly
MWCOE004	Manual	4 times yearly
MWCOE005	INW	2 times daily
MWCOE006	INW	2 times daily
MWCOE007	INW	2 times daily
MWCOE008	Manual	4 times yearly

INW=Instrumentation Northwest

SCADA=supervisory control and data acquisition

**Table 4-2**  
**Muscoy Plume Extraction System Performance Monitoring Sampling Locations and Rationale**

Well Designation	Cross Reference/Location	Rationale for Monitoring	Operable Unit
<b>Extraction Wells</b>			
EW-108, EW-108PA, EW-108PB	Northwest corner of 13th Street and G Street	To monitor treatment plant influent and plume concentrations.	Muscoy
EW-109, EW-109PA, EW-109PB	North side Home Street between Peris Street and Herris Street	To monitor treatment plant influent and plume concentrations.	Muscoy
EW-110, EW-110A, EW-110B, EW-110C, EW-110D, EW-110E	East side Garner Street approximately 400 feet south of 14th Street	To monitor treatment plant influent and plume concentrations.	Muscoy
EW-111, EW-111A, EW-111B, EW-111C, EW-111D	Southwest corner of Pico Street and 14th Street	To monitor treatment plant influent and plume concentrations.	Muscoy
EW-112, EW-112PA, EW-112PB	North side of Virginia Street approximately 200 feet east of Medical Center Drive	To monitor treatment plant influent and plume concentrations.	Muscoy
<b>Monitoring Wells</b>			
MW-128A, 128B, 128C	Across from Knights of Columbus	Monitoring points upgradient from the Muscoy plume front extraction well network.	Muscoy
MW-129A, 129B, 129C	16 th Street, west of Medical Center Drive	Monitoring points upgradient from the Muscoy plume front extraction well network.	Muscoy
MW-130A, 130B, 130C	Mt. Vernon to 19th Street, left on Garner Street, wells at end of street	Monitoring points upgradient from the Muscoy plume front extraction well network.	Muscoy
MW-135A, 135B, 135C	Orange Street, west of H Street Interstate 215 South on-ramp) in sidewalk on southside of Orange Street.	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-136A, 136B, 136C	11th Avenue between Perris Street and L Street, in landscaping north side of street	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-137A, 137B, 137C	Herrington Avenue, south of Baseline on west side of street	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-138A, 138B, 138C	Western Avenue, south of Baseline on sidewalk on west side of street	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-139A, 139B, 139C	Wilson Avenue, south of Baseline on east side of street	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy
MW-140A, 140B, 140C	Garner Park, Encanto Park	Monitoring points downgradient from extraction wells, used to monitor groundwater extraction system effectiveness.	Muscoy

**Table 5-1**  
**19th Street Treatment Plant Operational Issue Status**  
**September 2005**

**Reporting Period:** September 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

Issue/Discrepancy	Responsibility	Recommended Corrective Action	Schedule	Notes/Conclusions
No. 5 and No. 6 flowmeters on GAC Vessel not operable.	URS	Troubleshoot and repair as needed	Complete by 30 December 2005	URS is working with its subcontractors to repair.
ACV3 continues to leak	URS	Troubleshoot and repair as needed	Complete by 30 December 2005	URS is working with its subcontractors to repair.
Vessel 6B: influent gauge possibly leaking.	URS	Repair or replace deficient gauges	Complete by 30 December 2005	URS is working with its subcontractors to repair or replace.
Vessel 4B: 160 psi gauge leaked fluid and missing plug	URS	Repair or replace deficient gauges	Complete by 30 December 2005	URS is working with its subcontractors to repair or replace.
Vessel 1A: 160 psi gauge needs calibration, will not zero	URS	Repair or replace deficient gauges	Complete by 30 December 2005	URS is working with its subcontractors to repair or replace.
Vessel 4A: air/vacuum relief valve will not seat.	URS	Troubleshoot and repair as needed	Complete by 30 December 2005	URS is working with its subcontractors to repair.
Add FIT07 to SCADA to SCADA screen	SBMWD	SBMWD will update SCADA	Schedule not set	
D/P transducers 6A, 13A, 13B, 1A not working. 8B D/P transducer is missing.	URS	Troubleshoot and repair or replace as needed	Complete by 30 December 2005	URS is working with its subcontractors to repair or replace.
D/P transducer on inlet headers should read psi not % difference	URS	Remove D/P transducers and send to factory for repairs.	Remove immediately	Factory is located in Germany. Several months will be need to receive repaired probes.
No communications between treatment plant and booster pump room.	URS/SBMWD	Troubleshoot and repair	No schedule set	URS/SBMWD to determine cause.

ACV=automatic control valve

D/P=differential pressure

GAC=granular activated carbon

psi=pounds per square inch

SBMWD=City of San Bernardino Municipal Water Department

SCADA=supervisory control and data acquisition

**Table 5-2**  
**Encanto Park Booster Pump Station Operational Issue Status**  
**September 2005**

**Reporting Period:** September 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

Issue/Discrepancy	Responsibility	Recommended Corrective Action	Schedule	Notes/Conclusions
None reported				



**Table 5-3**  
**Extraction Well Operational Issue Status**  
**September 2005**

**Reporting Period:** September 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

Issue/Discrepancy	Responsibility	Recommended Corrective Action	Schedule	Notes/Conclusions
None reported				

**Table 5-4**  
**Monitoring Well Operational Issue Status**  
**September 2005**

**Reporting Period:** September 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

Issue/Discrepancy	Responsibility	Recommended Corrective Action	Schedule	Notes/Conclusions
Communication issues with SCADA system.	SBMWD	Trouble shoot and repair as needed	Schedule not set	
Electrical panel interference from EW-109C.	SBMWD	Troubleshoot and repair as needed	No schedule set	

EW=extraction well

SBMWD=City of San Bernardino Municipal Water Department

SCADA=supervisory control and data acquisition

**Table 5-5**  
**Summary of Muscoy OU O&M - GAC Treatment Plant**  
**September 2005**

**Reporting Period:** September 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

19th Street North GAC Treatment Plant	
Description routine maintenance performed	Daily equipment checks performed (see DHS report)
Description of problems encountered	1. Increased differential pressure through GAC filter beds. 2. Lost SCADA monitoring and Nitrate analyzer, discovered bad Serial Cards on each side of the link. 3. Vessel pair 6 showing 0 flow rate through meter. 4. A few oil filled gauges still ne
Description of process improvements implemented	1. Backwash all lead vessels. 2. Reported to Nick Reylek at URS.

DHS=California Department of Health Services  
GAC=granular activated carbon  
O&M=operations and maintenance  
OU=operable unit  
SCADA=supervisory control and data acquisition

**Table 5-6**  
**Summary of Treatment Plant Flow Data and Mass Removal Estimates**  
**September 2005**

Treatment Plant	Extraction Wells Treated By Plant	Treated Water Volume (acre-ft)	Average Monthly Flow Rate (gpm)	Estimated Monthly GAC Mass Removal <sup>(a)</sup> (lbs)	Estimated Cumulative GAC Mass Removal <sup>(b)</sup> (lbs)
19th Street GAC	EPA 001 <sup>(c)</sup> , EPA 108, EPA 109, EPA 110, EPA 111 and EPA 112	1,330.2	10,033	22.4	121.3

(a) - Monthly mass removal estimates are based on Monthly Treatment Summary sheets documented in monthly DHS reports.

(b) - Cumulative mass removal estimates are for the period since shakedown and startup activities commenced in March 2005.

(c) - Since the beginning of March, extracted groundwater from EPA 001 has been diverted to the 19th Street Treatment Plant. Therefore, the sum of volume of groundwater extracted from Muscoy OU wells differ from the sum of the volume treated by the 19th Street Treatment Plant.

acre-ft=volume of water sufficient to cover an acre of land to a depth of 1 foot, or approximately 325,851 U.S. gallons.

DHS=California Department of Health Services

EPA=United States Environmental Protection Agency

GAC=granular activated carbon

gpm=gallons per minute

lbs=pounds

OU=operable unit

**Table 5-7**  
**Summary of Muscoy OU O&M - Extraction Wells**  
**September 2005**

**Reporting Period:** September 2005  
**System Shakedown Startup:** March 2005  
**Official System Startup:** July 25, 2005

<b>Muscoy Plume Extraction Well Network (EPA 108, EPA 109, EPA-110, EPA-111 and EPA 112)</b>	
Description of routine maintenance performed	Daily equipment checks performed (see DHS report), monthly hands on physical, annual oil change, semi-annual check of VFD
Description of problems encountered	1. EPA112 Well failed 9/19/05, replaced circuitry board in EPA112. 2. Electrical Storm resulting in temporary equipment failures at EPA108 and EPA 111. Wells faulted on overload and were restarted within 2 hours. This occurred at 6:00 a.m. on 9/20/05.
Description of process improvements implemented	1. Replaced I.G.B.T's at EPA112. 2. Reset above equipment.

DHS=California Department of Health Services  
EPA=United States Environmental Protection Agency  
I.G.B.T.=Insulated Gate Bipolar Transistor  
OU=operable unit  
O&M=operations and maintenance  
VFD=variable frequency drive

**Table 5-8**  
**Summary of Extraction Well Flow Data**  
**September 2005**

Extraction Well	Monthly Extracted Water Volumes (acre-ft)	Average Monthly Flow Rate (gpm)	Cumulative Volume Extracted <sup>(a)</sup> (acre-ft)	Number of Days in Month =	30
				Monthly Run Time (days)	Monthly Down Time (days)
Muscoy Plume Extraction Well Network					
EPA 108	167.8	1,265	1,109	30.0	0.0
EPA 109	175.4	1,323	1,057	30.1	-0.1
EPA 110	297.8	2,246	1,590	30.1	-0.1
EPA 111	327.9	2,473	1,650	30.0	0.0
EPA 112	162.2	1,223	851	28.1	1.9
Network Total	1131.1	8,531	6,258		

(a) - Cumulative volume extracted since Muscoy commenced operations in March 2005.

acre-ft=volume of water sufficient to cover an acre of land to a depth of 1 foot, or approximately 325,851 U.S. gallons.

gpm=gallons per minute

**Table 5-9**  
**3-Month Rolling Average Extraction Volume and Extraction Rate Calculations**  
**September 2005**

Extraction Well	Run Times (Days)			Total Down Time For Last Two Months	Extraction Volumes (acre-ft)			Extraction Rates (gpm)			
	August 2005	September 2005	Total For Last Two Months		August 2005	September 2005	Total Pumpage Last Two Months	2- Month Rolling Average Extraction Rate	Design Extraction Rate (DER)	Target Extraction Rate (TER) <sup>(a)</sup>	Difference Between 2-Month Rolling Average and TER
Days in Period >>	31	30	61								
<b>Muscoy Plume Extraction Well Network<sup>(b)</sup></b>											
EPA 108	30.9	30.0	60.9	0.1	172.4	167.8	340		1300		
EPA 109	30.3	30.1	60.4	0.6	179.6	175.4	355		1300		
EPA 110	27.0	30.1	57.1	3.9	299.4	297.8	597		2500		
EPA 111	21.0	30.0	50.9	10.1	322.1	327.9	650		2500		
EPA 112	30.6	28.1	58.7	2.3	176.1	162.2	338		1300		
<b>Network Total</b>					<b>1149.6</b>	<b>1131.1</b>	<b>2,281</b>	<b>8,460</b>	<b>8,900</b>	<b>8,046</b>	<b>414</b>

(a) = The TER is currently equal to the maintenance-adjusted DER, which is adjusted for a maintenance allowance of 35 days per year.

(b)= Muscoy Plume extraction well network is not O&F, and the DER has not been finalized. Per the terms of the SOW, the DER will be no higher than what is shown.

DER =Design Extraction Rate

acre-ft=volume of water sufficient to cover an acre of land to a depth of 1 foot, or approximately 325,851 U.S. gallons.

gpm=gallons per minute

O&F=Operable and Functional

SOW=Statement of Work (entered with CD March 23, 2005)

TER=Target Extraction Rate

**Table 5-10**  
**Summary of Newmark OU O&M - Water-Level Monitoring**  
**September 2005**

**Reporting Period:** September 2005  
**System Operation Date:** October 1, 2000  
**Operations Completed:** 6 years 0 months

Newmark and Muscoy OU Monitoring Wells	
Description of routine monitoring and maintenance performed	Periodic download of RTU based water-level data. Collection of manual water levels to verify RTU based readings.
Description of problems encountered	Elevation offsets within the software were inadvertently reset during contractor programming activities. The offsets for 6 monitoring wells were affected. This resulted in skewed readings for water levels at select locations. Corrections were applied to the data to correct the water-level elevations and the RTU's were reprogrammed with the correct offsets. In addition, in some instances incorrect elevation offsets were programmed into the RTU. This resulted in incorrect transducer water level readings and poor comparison of transducer and hand water-level data. Verification of hand level data were not consistently collected for all wells and/or transposing of hand level data occurred during entry into data sheets. This resulted in loss of verification data and had a minor effect on data corrections/interpretations. In some instances hand level data and RTU data vary by more than 0.3 ft. The City's action level is 0.3 ft therefore elevation offsets for the affected wells will need to be modified.
Description of process improvements implemented	Implemented new policy to control personnel and outside contractors access to the SCADA/RTU systems. Instituted new electronic field data entry form to minimize errors and provide instant feedback on potential well head measurement inaccuracies, real time comparison of hand level, RTU water-level and transducer elevation offset drift. New field form also helps to assure that a basic set of information will be collected site wide and provides standard comments and notes to more accurately determine the extent and nature of work completed at each site during the monitoring period. Completed field verification on surveyed elevations and measuring points used during monitoring. Where these differed, measured an elevation offset and entered data into field entry data form.
Deviations from the operational requirements of the consent decree	None. Daily water-level readings were collected each day as required by the SOW.
Newmark and Muscoy OU Extraction Wells	
Description of routine monitoring and maintenance performed	Periodic downloaded water-level data from RTUs as part of the completion of the Muscoy OU startup aquifer testing (per the schedule in the EPA/URS Field Sampling Plan) and less frequently for extraction wells monitored as part of Newmark OU IRA operations. Repaired EPA 111 sensors PA,PB,PC and PD. Collected monthly water levels from extraction well casings.
Description of problems encountered	Elevation offsets were inadvertently reset during contractor programming activities. The offset for 8 extraction wells were affected. This resulted in skewed readings for water level at select locations. This resulted in incorrect transducer water-level readings and poor comparison of transducer and hand level data. Corrections were applied to the data to correct the water-level elevations and the RTUs were reprogrammed with the correct offsets. Verification hand level data were not consistently collected for all wells and/or transposing of hand level data occurred during entry into data sheets. This resulted in loss of verification data and had a minor effect on data corrections/interpretations. In some instances hand level data and RTU data vary by more than 0.3 ft. The City's action level is 0.3 ft, therefore elevations offsets for the affected wells will need to be modified. RTU memory failures occurred at one location (EPA 007). In this case daily water-level readings were able to be recovered through the SCADA system.
Description of process improvements implemented	Implemented new policy to control personnel and outside contractor access to the SCADA/RTU Systems. Instituted new electronic field data entry form to minimize errors and provide instant feedback on potential well head measurement inaccuracies, real time comparison of hand level and RTU water levels, and transducer elevation offset drift. Implemented new policy to control personnel and outside contractors access to the SCADA/RTU systems. Instituted new electronic field data entry form to minimize errors and provide instant feedback on potential well head measurements inaccuracies, real time comparison on hand level and RTU water levels, and transducer elevation offset drift. New field form also helps to assure that a basic set of information will be collected site wide and provides standard comments and notes to more accurately determine the extent and nature of work completed at each site during the monitoring period. Completed field verification of surveyed elevations and measuring points used during monitoring. Where these differed measured an elevation offset and entered data into field entry data form.
Deviations from the operational requirements of the consent decree	The monthly manual water level from the extraction well casing was not collected for EPA 007 during August.



**Table 5-10**  
**Summary of Newmark OU O&M - Water-Level Monitoring**  
**September 2005**

**Reporting Period:** September 2005  
**System Operation Date:** October 1, 2000  
**Operations Completed:** 6 years 0 months

Site-Wide Monitoring Wells	
Description of routine monitoring and maintenance performed	Collected monthly manual water-level measurements on July 20, July 22, July 26, August 29 and September 26, 2005
Description of problems encountered	The City is unable to collect Site-wide manual water levels from a some of wells designated in the SOW due to access limitations, water-level depths beyond the length of the sounding tape, or omissions. In addition, the City has not been able to locate one well (PZ125) it appears the well has been paved over.
Description of process improvements implemented	Instituted new electronic field data entry form to query collection of data from the entire well list and minimize data entry errors. New field form also helps to assure that a basic set of information will be collected site wide and provides standard comments and notes to more accurately determine the extent and nature of work completed at each site during the monitoring period. Complete a field verification of surveyed elevations and measuring points used during monitoring. Where these differed, the elevation offsets were measured and used to estimate the elevation of the actual measurement reference point. The revised reference elevations were entered into new electronic data entry field form.
Deviations from the operational requirements of the consent decree	The Site-wide manual water levels were not collected from the following wells: MW 126(well appears to be dry), PZ-124(well appears to be dry, PZ 125(well appears to have been paved over(, 16th & Sierra (unable to get sounder down next to column pipe for the August and September measurements), Muscoy Mutual No. 5 (air line installed by Muscoy Mutual prevents the lowering of the sounding tape and we are not authorized to remove; July August and September rounds), MW Paperboard (depth to water beyond the length of the water level measuring tape is September)
Wells Monitored Voluntarily	
Description of routine monitoring and maintenance performed	Collected monthly manual water-level measurements on August 29, 2005 and September 26, 2005. Downloaded electronic water-level data from USGS website.
Description of problems encountered	31st and Mt. View is located in a confined space, the City is in the process of developing an alternative measuring method to monitor this well.

**Note:**

This table includes a summary of the water-level monitoring issues that occurred over the entire water-level monitoring reporting period for the Third Quarter 2005 ( July 1 to September 30, 2005).

EPA=United States Environmental Protection Agency

ft=foot

IRA=Interim Remedial Action

OU=operable unit

O&M=operations and maintenance

PZ=piezometer

RTU=remote telemetry unit

SCADA=supervisory control and data acquisition

SOW=Statement of Work

USGS=United States Geological Survey

**Table 5-11**  
**Muscoy Plume Groundwater Elevations Used For Contouring**

Well	HS Zone	Easting <sup>a</sup> (ft)	Northing <sup>a</sup> (ft)	Groundwater Elevation 09/26/05
<b>Shallow Zone</b>				
EW-001A	1	6775522	1866594	916.00
EW-002A	1	6776472	1866742	933.19
EW-003A	1	6777152	1866776	NA
EW-004A	1	6777957	1866566	NA
EW-005A	NA	6778998	1866536	NA
EW-108A	NA	6773788	1868089	926.40
EW-109A	NA	6771905	1868375	841.45 <sup>b</sup>
EW-110B	NA	6770268	1868169	928.25
EW-111B	NA	6768387	1868531	905.53
EW-112A	1	6766938	1868507	919.63 <sup>b</sup>
MW-012A	1	6774894	1865969	936.44
MW-013A	1	6776958	1866005	NA
MW-014A	1	6778308	1865949	NA
MW-128A	1	6768012	1873207	968.14
MW-129A	1	6766410	1869927	945.30
MW-130A	1	6770220	1871569	957.01
MW-135A	1	6773043	1866906	927.55
MW-137A	1	6769013	1867110	938.64
MW-138A	1	6767776	1867135	940.88
MW-139A	1	6766120	1866924	944.53
Garner Park B	1	6769989	1864990	945.31
MUNI-103 (State St.)	1	6762726	1870149	954.95
Darby <sup>b</sup>	1	6763750	1875800	991.28 <sup>b</sup>
<b>Intermediate Zone</b>				
EW-109B	2	6771907	1868376	842.17 <sup>b</sup>
EW-110D	2	6770269	1868169	864.57
EW-111C	2	6768388	1868531	892.13
EW-112B	2	6766938	1868507	919.22 <sup>b</sup>
MUNI-101 (Olive & Garner)	2	6769831	1866362	804.23
MUNI-18 (27th & Acacia)	2	6774721	1874598	901.49
MUNI-23 (16th & Sierra)	2	6777829	1870023	NA
MW-128C	2	6768012	1873207	892.30
MW-129B	2	6766410	1869928	947.74
MW-130C	2	6770220	1871568	885.15
MW-136B	2	6771196	1866640	893.12
MW-137B	2	6769013	1867110	906.26
MW-138B	2	6767777	1867135	920.32
MW-139B	2	6766119	1866924	939.93

**Table 5-11**  
**Muscoy Plume Groundwater Elevations Used For Contouring**

Well	HS Zone	Easting <sup>a</sup> (ft)	Northing <sup>a</sup> (ft)	Groundwater Elevation 09/26/05
<b>Not Used</b>				
EW-001B	3	6775522	1866594	865.48
EW-002B	3	6776472	1866742	866.18
EW-003B	3	6777152	1866776	NA
EW-004B	3	6777957	1866566	NA
EW-005B	3	6778998	1866536	NA
EW-108B	3	6773788	1868089	869.62
EW-109C	3	6771908	1868376	839.72
EW-110A	0.5	6770268	1868168	935.47
EW-110C	1.9	6770269	1868168	876.28
EW-110E	3	6770288	1868151	843.86
EW-111A	0.5	6768387	1868531	942.15
EW-111D	2.1	6768407	1868515	878.59
Garner Park C	2	6769989	1864990	NA
MUNI-16 (Leroy)	1*	6779098	1877196	1096.35
MUNI-24 (Gilbert)	2	6779933	1869306	928.53
MUNI-108 (Mallory 3)	2	6759545	1875165	976.66
MW-010A	1.5	6776744	1869213	910.45
MW-010B	1.9	6776744	1869213	891
MW-011A	3	6777619	1867493	882.32
MW-011B	3	6777619	1867493	881.42
MW-011C	3	6777619	1867493	880.41
MW-012B	3	6774894	1865969	877.05
MW-013B	3	6776958	1866005	NA
MW-013C	3	6776958	1866005	NA
MW-014B	3	6778308	1865949	NA
MW-128B	1.5	6768012	1873207	933.20
MW-129C	2.1	6766411	1869927	906.40
MW-130B	1.5	6770221	1871569	927.09
MW-135B	3	6773044	1866906	866.44
MW-135C	3	6773044	1866906	876.21
MW-136A	1.9	6771196	1866640	906.16
MW-136C	3	6771195	1866640	854.88
MW-137C	3	6769013	1867109	889.97
MW-138C	3	6767777	1867135	878.77
MW-139C	3	6766119	1866924	930.77

\*Not able to determine.

<sup>a</sup> State Plane NAD 83 Feet

<sup>b</sup> Corrected or extrapolated water level

ft bgs=feet below ground surface

HS= Hydrostratigraphic zones: Zone 1 = shallow (<500 ft bgs). Zone 2 = Intermediate. Zone 3 = Deep. Fractional values indicate intermediate water levels.

NA= not available

NAD=North American Datum

**Table 5-12**  
**Extraction and Monitoring Well Monitoring Results - PCE and TCE**  
**September 2005**

Extraction Well	Date Sampled	PCE Concentration (µg/L)	TCE Concentration (µg/L)
<b>Muscoy Plume Extraction Well Network</b>			
EPA 108 *	NM	NM	NM
EPA 109 *	NM	NM	NM
EPA 110 *	NM	NM	NM
EPA 111 *	NM	NM	NM
EPA 112 *	NM	NM	NM
EW-108	9/21/2005	1.7	<0.5
EW-108PA	9/21/2005	9.8	2.9
EW-108PB	9/21/2005	<0.5	<0.5
EW-109	9/21/2005	3.3	0.95
EW-109PZA	9/21/2005	10	2.7
EW-109PZB	9/21/2005	0.98	<0.5
EW-110	9/21/2005	3.1	0.72
EW-110PZA	9/20/2005	1.4	<0.5
EW-110PZB	9/20/2005	7.8	1.4
EW-110PZC	9/20/2005	14	3.2
EW-110PZD	9/20/2005	6	3.5
EW-110PZE	9/21/2005	<0.5	<0.5
EW-111	9/20/2005	5.1	0.76
EW-111PZA	9/20/2005	3.3	<0.5
EW-111PZB	9/20/2005	1.7	<0.5
EW-111PZC	9/20/2005	0.77	<0.5
EW-111PZD	9/20/2005	1.8	<0.5
EW-112	NM	NM	NM
EW-112PA	9/20/2005	2.1	<0.5
EW-112PB	9/20/2005	3.4	<0.5
MW-128A	9/20/2005	8.7	2.8
MW-128B	9/20/2005	<0.5	<0.5
MW-128C	9/20/2005	<0.5	<0.5
MW-129A	9/19/2005	0.5	0.5
MW-129B	9/19/2005	3.4	<0.5
MW-129C	9/19/2005	<0.5	<0.5
MW-130A	9/20/2005	2.4	<0.5
MW-130B	9/20/2005	9.8	2.9
MW-130C	9/20/2005	<0.5	<0.5
MW-135A	9/19/2005	4.8	1.8
MW-135B	9/19/2005	<0.5	<0.5
MW-135C	9/19/2005	<0.5	<0.5

**Table 5-12**  
**Extraction and Monitoring Well Monitoring Results - PCE and TCE**  
**September 2005**

Extraction Well	Date Sampled	PCE Concentration (µg/L)	TCE Concentration (µg/L)
<b>Muscoy Plume Extraction Well Network</b>			
MW-136A	9/19/2005	<0.5	<0.5
MW-136B	9/19/2005	<0.5	<0.5
MW-136C	9/19/2005	<0.5	<0.5
MW-137A	9/19/2005	2.1	0.94
MW-137B	9/19/2005	<0.5	<0.5
MW-137C	9/19/2005	<0.5	<0.5
MW-138A	9/19/2005	3.9	<0.5
MW-138B	9/19/2005	<0.5	<0.5
MW-138C	9/19/2005	<0.5	<0.5
MW-139A	9/19/2005	0.54	<0.5
MW-139B	9/19/2005	<0.5	<0.5
MW-139C	9/19/2005	<0.5	<0.5

\* Data provided by SBMWD

µg/l=microgram per liter

NM=Not monitored during the reporting period

PCE=tetrachloroethene

SBMWD=City of San Bernardino Municipal Water Department

TCE=trichloroethene

**Table 5-13**  
**Treatment Plant Monitoring Results - PCE and TCE**  
**September 2005**

Extraction Well	Date Sampled	PCE Concentration (µg/L)	TCE Concentration (µg/L)
<b>19th Street GAC Treatment Plant</b>			
Influent	30-Sep-05	5.2	1.0
Lead Vessel 1	30-Sep-05	<0.5	<0.5
Lead Vessel 2	30-Sep-05	<0.5	<0.5
Lead Vessel 3	30-Sep-05	<0.5	<0.5
Lead Vessel 4	30-Sep-05	<0.5	<0.5
Lead Vessel 5	30-Sep-05	<0.5	<0.5
Lead Vessel 6	30-Sep-05	<0.5	<0.5
Lead Vessel 8	30-Sep-05	<0.5	<0.5
Lead Vessel 9	30-Sep-05	<0.5	<0.5
Lead Vessel 10	30-Sep-05	<0.5	<0.5
Lead Vessel 11	30-Sep-05	<0.5	<0.5
Lead Vessel 12	30-Sep-05	<0.5	<0.5
Lead Vessel 13	30-Sep-05	<0.5	<0.5
Combined Effluent	1-Sep-05	<0.5	<0.5
	8-Sep-05	<0.5	<0.5
	15-Sep-05	<0.5	<0.5
	30-Sep-05	<0.5	<0.5
	29-Sep-05	<0.5	<0.5

These data have been collected and validated using standard SBMWD protocol as required under SBMWDs DHS Permit. Once the project QA/QC Plan has been prepared and approved, SBMWD will adhere to the QA/QC plan when sampling the extraction wells and validating data.

DHS=California Department of Health Services

GAC=granular activated carbon

µg/l=microgram per liter

NM=Not monitored during the reporting period

PCE=tetrachloroethene

QA/QC=quality assurance/quality control

SBMWD=City of San Bernardino Municipal Water Department

TCE=trichloroethene

**Table 5-14**  
**Summary of Compliance with Performance Criteria**  
**September 2005**

Extraction Well Network	Compliance Criteria Met (yes/no)	Comments
<b>Flow Rate Performance - Target Extraction Rate</b>		
Muscoy Plume Extraction Well Network	Yes	The 2-month rolling average (August 2005 to September 2005) extraction rate for the Muscoy OU wells was 8,460 gpm, which exceed the TER of 8,046 gpm.
<b>Flow Performance - Particle Tracking</b>		
Muscoy Plume Extraction Well Network	SCADA System and RTU System Maintenance	The 2-month rolling average exceeded the TER, requiring 85% upgradient capture. During September 2005, 90% upgradient capture was achieved in the shallow zone and 100% in the intermediate zone.
<b>Contaminant Performance - Downgradient Monitoring Wells</b>		
Muscoy Plume Extraction Well Network	Other	MW128A, MW129B, MW130A, MW130B, MW135A, MW137A, MW138A had PCE concentrations above 1 µg/L. MW135A, MW138A and MW139A had increasing trends Pre-Startup. MW135A, MW137A and MW139A had increasing trends Post-Startup. MW135A, MW138A and MW139A had increasing historical trends.

gpm=gallons per minute

OU=operable unit

µg/l=microgram per liter

PCE=tetrachloroethene

RTU=remote telemetry unit

SCADA=supervisory control and data acquisition

TER=target extraction rate